Listing of the Claims

Claim 1. (currently amended) A method for reducing sparkle artifacts due to non linearity in a transfer function of ~~in~~ a liquid crystal imager, comprising the steps of:

~~dividing~~ decomposing (in 12) a video signal (INPUT X) for a picture into a higher brightness level signal and a lower brightness level signal;

slew rate limiting (in 22) said lower brightness level signal;

delaying (in 24) said higher brightness level signal to match a processing delay incurred by said slew rate limiting; and,

combining (in 26) said slew rate limited lower brightness level signal and said delay matched higher brightness level signal to generate a modified video signal (OUTPUT X') less likely to result in sparkle artifacts in said imager.

Claim 2. (currently amended) The method of claim 1, comprising the step of ~~dividing~~ decomposing said video signal in accordance with a transition between lower and higher gain portions of a gamma table associated with said imager.

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Claim 3. (currently amended) The method of claim 1, wherein said ~~dividing~~ decomposing step ~~comprises~~ includes the steps of:

selecting a brightness level threshold (T);

comparing successive input brightness levels of said luminance signal to said selected threshold (IF X>T, IF X<T, IF X=T);

for each said input brightness level greater than said threshold in said comparing step, assigning to said higher brightness level signal a brightness level equal to a difference between said greater input brightness level and said threshold (IF X>T, H=X-T) and assigning to said lower brightness level signal a brightness level equal to said threshold (IF X>T, L=T); and,

for each said input brightness level less than said threshold in said comparing step, assigning to said higher brightness level signal a brightness level equal to zero (IF X<T, H=O) and assigning to said lower brightness level signal a brightness level equal to said input brightness level (IF X<T, L=X).

Claim 4. (original) The method of claim 3, comprising the steps of:

assigning to said higher brightness level signal a brightness level equal to zero if said input brightness level is equal to said threshold; and,

assigning to said lower brightness level signal a brightness level equal to said input brightness level if said input brightness level is equal to said threshold.

Claim 5. (original) The method of claim 1, comprising the step of delaying said higher brightness level signal to compensate for a delay incurred in said slew rate limiting.

Claim 6. (original) The method of claim 1, comprising the steps of:

applying said sparkle reducing steps to a luminance signal for said picture;

delaying chrominance signals for said picture; and,

generating a plurality of video drive signals from said modified luminance signal and said delayed chrominance signals.

Claim 7. (original) The method of claim 6, comprising the steps of:

applying said sparkle reducing steps to at least one of said video drive signals; and,

delaying all non-sparkle-reduced video drive signals.

Claim 8. (original) The method of claim 1, comprising the steps of:

generating a plurality of video drive signals from luminance and chrominance signals;

applying said sparkle reducing steps to at least one of said video drive signals; and,

delaying all non-sparkle-reduced video drive signals.

Claim 9. (original) The method of claim 8, comprising the step of applying said sparkle reducing steps to each of said video drive signals.

Claim 10. (original) The method of claim 7 comprising the step of independently selecting slew rate limits for said slew rate limiting steps.

Claim 11. (currently amended)A circuit for reducing sparkle artifacts due to non linearity in a transfer function of ~~in~~ a liquid crystal imager, comprising:

means for ~~dividing~~ decomposing a video signal for a picture into a higher brightness level signal and a lower brightness level signal;

means for slew rate limiting said lower brightness level signal;

means for delaying said higher brightness level signal to match a processing delay incurred by said slew rate limiting; and,

means for combining said slew rate limited lower brightness level signal and said delay matched higher brightness level signal to generate a modified video signal less likely to result in sparkle artifacts in said imager.

Claim 12. (currently amended) The circuit of claim 11, wherein said ~~dividing~~ decomposing means ~~comprises~~ includes:

a register for storing a selected threshold value;

a comparator for comparing successive input brightness levels of said luminance signal to said selected threshold value;

an algebraic circuit for subtracting said threshold value from every one of said input brightness levels greater than said threshold;

a clipping circuit for limiting to said threshold value every one of said input brightness levels greater than said threshold value

a first gate for propagating a zero value brightness level for every one of said input brightness levels less than said threshold value;

a second gate for propagating said input brightness level for every one of said input brightness levels less than said threshold; and,

said higher brightness signal is formed by outputs from said algebraic circuit and said first gate and said lower brightness level signal is formed by outputs from said clipping circuit and said second gate.

Claim 13. (original) The circuit of claim 12, wherein:

said higher brightness level signal is formed by said output of said first gate when said input brightness level is equal to said threshold value; and,

said lower brightness level signal is formed by said output of said second gate when said input brightness level is equal to said threshold value.

Claim 14. (original) The circuit of claim 11, wherein said threshold value relates to a transition between lower and higher gain portions of a gamma table associated with said imager.

Claim 15. (original) The circuit of claim 11, wherein said higher brightness level signal is delayed to match a delay incurred by operation of said slew rate limiting means.

Claim 16. (original) The circuit of claim 11, wherein said video signal is a luminance signal, and further comprising:

means for delaying chrominance signals for said picture; and,

means for generating a plurality of video drive signals from said modified luminance signal and said delayed chrominance signals.

Claim 17. (currently amended) The circuit of claim 16, comprising:

means for ~~dividing~~ decomposing at least one of said video drive signals into a higher brightness level video drive signal and a lower brightness level video drive signal;

means for slew rate limiting said lower brightness level video drive signal;

means for delaying said higher brightness level video drive signal to match a processing delay incurred by said slew rate limiting; and,

means for combining said slew rate limited lower brightness level video drive signal and said delay matched higher brightness level video drive signal to generate a modified video drive signal resulting in a further reduction of disclination in said imager.

Claim 18. (currently amended) The circuit of claim 17, wherein said brightness level thresholds for said luminance signal ~~dividing~~ decomposing means and said video drive signal ~~dividing~~ decomposing means are independently selectable.

Claim 19. (original) The circuit of claim 17, wherein slew rate limits for said slew rate limiting means are independently selectable.

Claim 20. (currently amended) The circuit of claim 17, comprising:

respective means for ~~dividing~~ decomposing, slew rate limiting, delaying and combining each one of said video drive signals; and,

each of said luminance signal ~~dividing~~ decomposing means and said video drive signal ~~dividing~~ decomposing means having independently selectable brightness level thresholds and each of said slew rate limiting means having independently selectable slew rate limits.

Claim 21. (currently amended) A circuit for reducing sparkle artifacts due to non linearity in a transfer function of ~~in~~ a liquid crystal imager, comprising:

a decomposer for dividing a video signal for a picture into a higher brightness level signal and a lower brightness level signal;

a slew rate limiter for processing said lower brightness level signal, said slew rate limited lower brightness level signal being delayed;

a delay circuit for said higher brightness level signal matched to said processing delay in said slew rate limiter; and,

an algebraic circuit for combining said slew rate limited lower brightness level signal and said delay matched higher brightness level signal, and generating a modified video signal less likely to result in sparkle artifacts in said LCOS imager.

Claim 22. (original) The circuit of claim 21, wherein said decomposer circuit has a selectable threshold value.

Claim 23. (original) The circuit of claim 22, wherein said threshold value is related to a transition between lower and higher gain portions of a gamma table associated with said imager.

Claim 24. (original) The circuit of claim 22, wherein said higher brightness level signal is delayed to match a delay incurred by said slew rate limiter.

Claim 25. (original) The circuit of claim 21, wherein said video signal is a luminance signal, and further comprising:

delay circuits for delay matching chrominance signals for said picture with said modified luminance signal; and,

a color space converter for generating a plurality of video drive signals from said modified luminance signal and said delay matched chrominance signals.

Claim 26. (currently amended) The circuit of claim 25, further comprising:

a further decomposer for ~~dividing~~ decomposing at least one of said video drive signals into a higher brightness level video drive signal and a lower brightness level video drive signal;

a further slew rate limiter for said lower brightness level video drive signal;

a further delay circuit for delaying said higher brightness level video drive signal to match a processing delay incurred by said slew rate limiter; and,

a further algebraic circuit for combining said slew rate limited lower brightness level video drive signal and said delay matched higher brightness level video drive signal to generate a modified video drive signal, resulting in a further reduction of disclination in said imager.

Claim 27. (original) The circuit of claim 26, wherein said decomposer and said further decomposer have independently selectable brightness level thresholds.

Claim 28. (original) The circuit of claim 26, wherein said slew rate limiter and said further slew rate limiter have independently selectable slew rate limits.

Claim 29. (original) The circuit of claim 26, comprising:

respective decomposers, slew rate limiters, delay circuits and algebraic circuits for processing each one of said video drive signals; and,

each of said decomposers having independently selectable brightness level thresholds.